

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number
WO 2005/081578 A1

(51) International Patent Classification⁷: **H04R 3/14**

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/US2004/002698

(22) International Filing Date: 30 January 2004 (30.01.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **THOMSON LICENSING S.A.** [FR/FR]; 46 Quai A. LeGallo, Boulogne 92648 (FR).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **RUMREICH, Mark, Francis** [US/US]; 10308 Indian Lake Blvd. S., Indianapolis, Indiana 46236 (US).

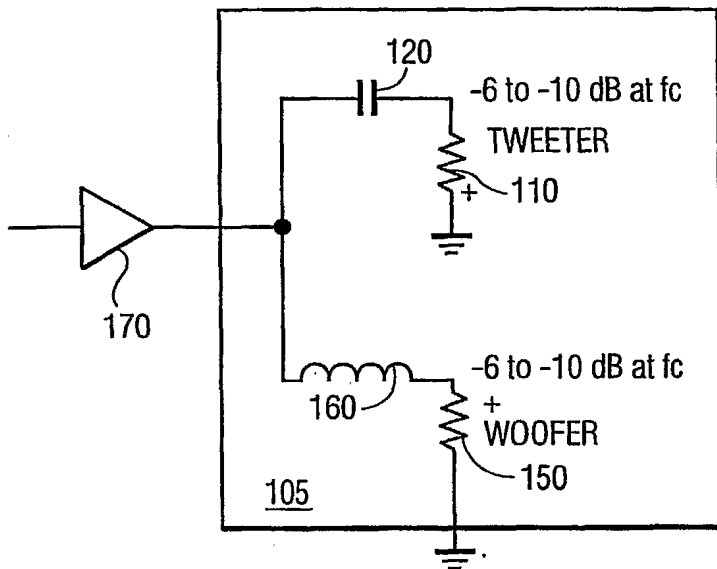
Published:
— with international search report

(74) Agents: **TRIPOLI, Joseph, S.** et al.; Two Independence Way, Suite #200, Princeton, NJ 08540 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

(54) Title: FIRST-ORDER LOUDSPEAKER CROSSOVER NETWORK



(57) Abstract: A first-order crossover network having low-pass and high-pass filters to respectively drive first and second loudspeakers in a loudspeaker system is designed such that the phase difference at a crossover frequency between output signals of the first and second loudspeakers is no greater than 60 degrees, so that the output signals are at least partially in phase. Preferably, the phase difference should be about 40 degrees to create a near in-phase effect. The polarity in which the first loudspeaker is coupled to the first-order crossover network is an inverse of the polarity in which the second loudspeaker is coupled to the crossover network. Optionally, the input signals can be equalized to flatten the magnitude responses of the crossover network.

WO 2005/081578 A1